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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,374	09/30/2003	John W. Stafford	4420-A1	5203

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EXAMINER

PETKOVSEK, DANIEL J

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 05/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/674,374

Applicant(s)

STAFFORD ET AL.

Examiner

Daniel J. Petkovsek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed February 27, 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 and 29-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☒ Claim(s) 29-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on February 27, 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the amendment filed February 27, 2006. In accordance with the amendment, new claims 29-31 have been added, while claims 26-28 have been formally canceled. Claims 1-25 and 29-31 are pending.

Drawings

1. The drawings were received on February 27, 2006. These drawings are acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 9, 13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Tabuchi U.S.P. No. 5,764,832.

Tabuchi U.S.P. No. 5,764,832, teaches (Figs. 20, 21; column 15, line 31 through column 16, line 18) a high speed data interconnect apparatus comprising: a stiffening plate 1a with an elongated optical fiber mounting groove 2a defined on a surface thereof; a length of optical fiber 7 with first and second opposed ends defining an optical path, the optical fiber 7 being mounted in the groove 2a; a reflecting surface positioned adjacent to direct light at an angle of approximately ninety degrees; a laminate layer(s) 1b/3e encasing the stiffening plate 1a and the optical fiber 7 and including a light via for passage of light reflected by the first reflecting surface, and first bond pads 5 formed on a surface of the laminated layer(s) 1b/3e adjacent the

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light via for the electrical connections of a light element 6a, which clearly, fully meets Applicant's claimed limitations.

Regarding claim 2, element 6a is a photodetector.

Regarding claim 9, the groove has a generally V-shaped cross-section (see figures).

Regarding claim 13, an approximately 45 degree mirrored end is located in the groove in optical alignment with the optical fiber 7.

Regarding claim 16, the modulus of elasticity is inherently smaller in the laminate layer than in the stiffening plate.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-8, 10-12, 14, 15, and 17-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabuchi U.S.P. No. 5,764,832, and further in view of Kosemura U.S.P. No. 6,330,377 B1.

Tabuchi U.S.P. No. 5,764,832, in regard to the narrowest claimed independent claim 18, teaches (Figs. 20, 21; column 15, line 31 through column 16, line 18) a high speed data interconnect apparatus comprising: a stiffening plate 1a with an elongated optical fiber mounting groove 2a defined on a surface thereof; a length of optical fiber 7 with first and second opposed ends defining an optical path, the optical fiber 7 being mounted in the groove 2a; a first reflecting surface positioned adjacent to direct light at an angle of approximately ninety degrees; a laminate

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layer(s) 1b/3e encasing the stiffening plate 1a and the optical fiber 7 and including a first light via for passage of light reflected by the first reflecting surface, and first bond pads 5 formed on a surface of the laminated layer(s) 1b/3e, and a photo detector 6a (also see column 21, lines 15-20 for alternate use of an emitter/laser/etc.) mounted on the surface of the laminate in communication with the light via.

Tabuchi '832 does not explicitly teach that the module can be arranged in the form of having an emitter and receiver *both* in the ninety-degree configuration (Applicant's Figure 1).

Kosemura U.S.P. No. 6,330,377 B1 teaches (ABS; Figure 6; column 11, lines 1-63) a high speed data interconnect apparatus having a configuration with both an emitter 12a and a detector 12b, that send optical signals through vias 14a/14b, which are reflected off of micro-mirrors into (and out of) the waveguide 22, in which laminate layers 10a-10d are encasing the (planar) waveguide.

Since Tabuchi '832 and Kosemura '377 are both from the same field of endeavor, the purpose disclosed by Kosemura '377 would have been recognized in the pertinent art of Tabuchi '832.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to realize the optical apparatus of Tabuchi '832 in the format disclosed by Kosemura '377 for the purpose of transmitting and receiving an optical signal by use of a laser and a photodetector in a U-shaped configuration for efficient optical coupling through a substrate/groove structure.

It is noted that official notice is taken as to the type of optical emitter/receiver that is used. Any well-known type of emitter and/or receiver can be used in the system, and would

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have been recognized as obvious to a person having ordinary skill in the art at the time the invention was made. The Applicant has not stated any criticality as to the exact type of emitter and/or detector.

Regarding broader independent claim 23, the combination of Tabuchi '832 and Kosemura '377 teaches the broader claimed limitations (in comparison to narrower claim 18).

Regarding claims 3 and 4, the second reflecting surface with an emitter to a detector is disclosed in the combination rejection provided above.

Regarding claims 5 and 6, the specific composition of a "stiffening plate" would have been an obvious modification to a person having ordinary skill in the art at the time the invention was made. A person having ordinary skill in the art would have recognized that a "stiff" material would have been desirable in order to remain "stiff" during operation, and nickel iron/Teflon are "stiff" structures.

Regarding claims 7 and 8, the cross-section of the groove is an obvious design choice of the optical apparatus. A person having ordinary skill in the art would have recognized rectangular and/or v-groove for the groove shape. Applicant has not stated any criticality of having a particular groove shape, since each would function as equivalents.

Regarding claims 10, 11, and 14, the type of reflecting mirror and placement of the optical components (emitter) are obvious design choices of the optical apparatus. A person having ordinary skill in the art would have recognized a number of well-known reflectors, such as fiber reflectors and other 45 degree reflecting mechanisms. Applicant has not stated any criticality of having a particular reflecting surface, since each would function as equivalents.

Regarding claim 15, attaching a PCB to the device of Tabuchi '832 and adding laminate to cover and protect the PCB would have been obvious to a person having ordinary skill in the art at the time the invention was made. PCBs are well known in the optical integrated circuit art to control and allow the transmission of optical signals in integrated optical devices such as the one disclosed by Tabuchi '832, and laminate is well known in the art to protect optical/electrical components, and improving optical performance by eliminating sources of error from the system.

Regarding claims 19 and 24, the modulus of elasticity is inherently smaller in the laminate layer than in the stiffening plate. Regarding claims 20 and 25, a thickness of the laminate can be shown to be up to two times the thickness of the stiffening plate, further in view of Kosemura '377 (see Fig. 6).

Regarding claim 21, a V-groove shape is disclosed by Tabuchi '832.

Regarding claims 12 and 22, further in view of Kosemura '377, there are 45 degree micro-mirrors that reflect an optical signal incoming to the waveguiding region.

Allowable Subject Matter

6. Claims 29-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The relevant prior art of record does not teach or reasonably suggest that the stiffening plate has a coefficient of thermal expansion approximately matching a coefficient of thermal expansion of the optical fibers for reducing relative movement between the elements and for substantially eliminating stress in the fiber.

Response to Arguments

7. Applicant's arguments filed February 27, 2006 have been fully considered but they are not persuasive.

Applicant first traverses the rejections under 35 U.S.C. 102(b) to Tabuchi '832 by asserting that a "high speed data interconnect" is not disclosed. This argument is not persuasive. Clearly, Tabuchi can "interconnect" optical "data" from the photodiode, through the optical fiber, to a receiving medium. It is noted that "high speed" is a *relative* term in the art, and it is the opinion of the examiner that the structure disclosed by Tabuchi '832 transmits optical signals at "high" speeds, since the speed of light is, relatively, "high". Furthermore, the term "high speed data interconnect" is claimed solely in the preamble, with no subsequent structural limitations that would tie the preamble to the body of the claim.

Applicant next traverses the rejections under 35 U.S.C. 102(b) to Tabuchi '832 by asserting that the substrate "has nothing to do with stiffening or coefficients of thermal expansion" (see arguments page 17). This argument is not persuasive. Applicant is reminded that the Examiner must interpret the *claimed* limitations. The substrate of Tabuchi '832 meets the requirements of a "stiffening plate", since the substrate is both stiff (to enable a solid base for the fiber) and also acts as a plate. The substrate enables the entire optical device and the fiber to be "stiffened" or made "stiff".

Next, Applicant discusses the difference between printed circuit boards and semiconductor substrates. While the Examiner appreciates the thoughtful insight in the matter, it is noted that a "printed circuit board" is not claimed in any independent claim (1, 15, or 23).

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“Printed circuit board **lamine**te” is claimed and at issue, which differs greatly from a PCB itself.

Applicant is reminded that the Examiner only interprets the *claimed* limitations.

Applicant asserts that no “encasing” is disclosed, contemplated, or suggest (see arguments page 19). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., laminate applied to stiffening plate *on both upper and lower surfaces*) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The overlayer of the laminate meets the *claimed* limitations in that it encloses or encases the substrate by overlaying it and protecting it.

Applicant arguments in response to the 35 U.S.C. 103(a) rejections to Tabuchi '832 and further in view of Kosemura '377 are not persuasive. The combination of these references teach what was not explicitly taught by the Tabuchi '832 reference alone, which is fully addressed in the 103 rejections. Applicant fails to persuasively discuss what the Kosemura '377 reference was brought in to teach, that being *arranging the module in the form of having an emitter and receiver both in ninety degree configuration* (see rejection mailed November 28, 2005).

Finally, Applicant asserts that the addition of new claims 29-31 is not a new feature or amendment that would require additional searching. The Examiner does not agree with this assertion. Any new claims that narrow the claim scope will force the Examiner to reconsider and search more deeply into the subject matter at hand. As such a final rejection would be proper if new art were necessary to be used in rejecting the new claims (in a combination or standalone).

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However, this point is moot since claims 29-31 have been indicated as being allowable over the prior art of record (if included in their independent claims).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art: PTO-892 form reference A.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Petkovsek
May 3, 2006


AKM ENAYET ULLAH
PRIMARY EXAMINER